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ABSTRACT

The traditional method of conducting evaluation studies of agricultural extension programs is not sufficient when evaluating the impact on rural development, and must, therefore, be complemented by qualitative studies and careful evaluations of program objectives based on farmer needs. Traditional experimental evaluation studies do not register what happens between the before-and-after measurements nor show how changes actually occur, and therefore, do not indicate how a program might be improved or how it might work in a different setting. To overcome these deficiencies, more qualitative and process-oriented evaluation studies should be used to measure change in one or more characteristics, thereby enabling the assessment of past program quality and the betterment of future program quality. The assessment of program quality must include a careful evaluation of program objectives based on normative needs (as perceived by the sponsoring institution), felt needs (as expressed by the program recipient), and derived needs (as based on expressed attitudes and aspirations of the program recipient). An empirical study of Swedish dairy farmers' needs for agricultural extension programs illustrates application of the foregoing concepts. While it is difficult to determine which needs should be given priority, this study indicates that farmers differ in their derived needs for agricultural extension programs and that they perceive the usefulness of information differently. (AN)

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EVALUATING THE OBJECTIVES OF AGRICULTURAL EXTENSION PROGRAMS

Ulrich Nitsch

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EVALUATING THE OBJECTIVES OF AGRICULTURAL EXTENSION PROGRAMS

It is argued in this paper that the traditional way of conducting evaluation studies of agricultural extension programs is not sufficient when evaluating the impact on rural development. The traditional evaluation design, that follows the mode of an experimental study in the natural sciences, must be complemented by (1) more qualitative and process oriented evaluation studies and (2) careful evaluations of program objectives.

The evaluation of program objectives on the basis of needs is explored to some depth. It is suggested that we should distinguish between three categories of needs according to how they are defined and who defines them : (1) normative needs referring to needs as perceived by an extrinsic institution, (2) felt needs and (3) derived needs, the last-named categories referring to needs as perceived by the farmers themselves.

An experimental study of perceived needs for agricultural extension programs among dairy farmers in a Swedish province is presented. The study indicates that farmers' orientations in farming have implications for their needs for agricultural extension programs. The difficulties in

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determining which needs should be given priority in the evaluation of program objectives are discussed.

The Decline of the Agricultural Sector in Sweden

During the last few decades rural development in Sweden has been characterized by a drastic decline of the agricultural sector. From 1940 to 1970 the number of farm units declined by 48 percent, the area of arable land declinded by 18 percent and the number of people gainfully employed in farming went down as much as 73 percent (24:78-79) (Figure 1). Today there are only about 120,000 farm units left and the farming population is less than 5 percent of the total population (16:3-4)).

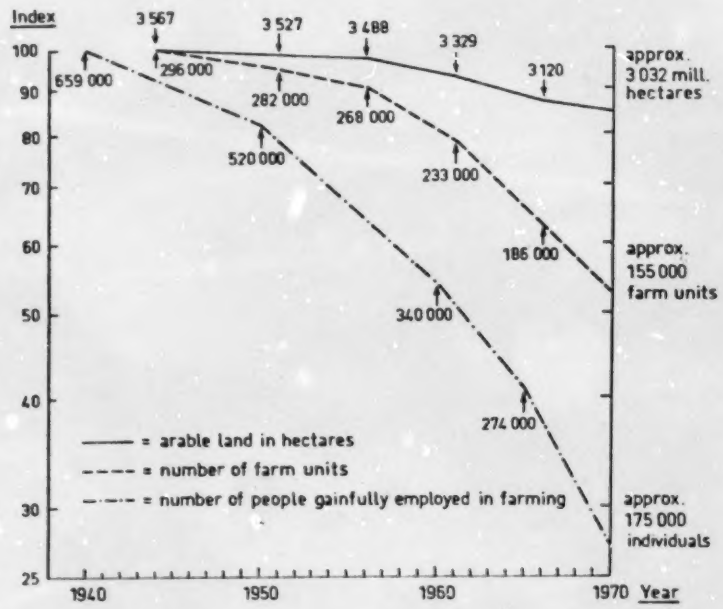

Figure 1. The Decline of the Agricultural Sector in Sweden from 1940 to 1970 (After Östberg, 24;79)

The decline of the agricultural sector and the subsequent out-migration from rural to urban areas was necessary for the expansion and development of the industrial sector. As the industrial sector was more productive and profitable, the process was seen as desirable for the society as a whole and promoted by governmental policies and programs. In the agricultural policy it was stated that farming should be adjusted to the technical development. Thereby we would avoid an unprofitable surplus production of food and release manpower from farming that could be transferred to industrial production (3:66-69).

Broadened Goals of the Agricultural Extension Service

The Swedish Agricultural Extension Service is a governmental agency and defined as an instrument for the implementation of the agricultural policy. In the early seventies the national program of the Agricultural Extension Service heavily emphasized the promotion of efficiency as the purpose of extension (5:11):

> Agricultural extension work is an integrated part of the activities of the National Board of Agriculture and as such dependent on the goal of the organization, which is to promote and facilitate efficiency in agricultural and horticultural production.

The means applied to increase efficiency were defined as specialization in farm production, expansion of farm sizes and assistance to farmers in finding alternatives for earning their living outside farming (4:35-40).

In the last few years, however, employment opportunities in the industrial sector have been decreasing. Increasing attention has been

directed to the negative consequences of the depopulation of rural areas and to various environmental implications of modern farm technology. Due to the changes and concerns the agricultural policy in Sweden has been modified. In the guidelines for a new agricultural policy in 1977, it is emphasized that the policy should not be in contradiction with planning in other sectors of the society. A new financial support program is now introduced with the aim of preserving a rural population and to create employment opportunities in certain rural areas. Another program is introduced to assure a reasonable equality in income distribution among different categories of farmers. It is also acknowledged in the new agricultural policy that the environmental implications of farm technology need to be considered (10,15).

As a consequence of these changes in the agricultural policy the goals of the Agricultural Extension Service have been broadened. The main goal is still defined as promoting efficiency in farming. But in addition, the Extension Service is assigned a responsibility to act for the maintenance of employment opportunities in rural areas and to adjust its programs in accordance with the guidelines of the new agricultural policy(14:21-22, 156-157).

Evaluation Studies on Agricultural Extension Programs

During the sixties and seventies evaluation studies carried out in Sweden on agricultural Extension programs have focused on (1) the economic outcome of and (2) the effect of different inputs in extension work.

Two studies have been conducted with the aim of measuring economic outcome of extension work (1, 21, 22). In these studies economic outcome was measured according to cost-benefit analyses. The total expenses for the extension activities studied were compared with the economic increases in farm production within a geographical area. In both studies it was found that the total increases in farmers' net earnings exceeded the costs of the extension activities.

Several studies have focused on the effect of different media and program designs on farmers' adoption of new practices (6, 7, 11, 12, 13). Most recently the National Board of Agriculture carried out three evaluation studies in which the effect of the mass media were compared with the effect of other extension activities (6, 7). It is not possible to draw any reliable conclusions concerning differences in the effect of the media and program designs from any of these studies.

In all of the studies referred to above the extension programs are evaluated by measuring the extent to which specific predefined objectives are attained. The studies are designed in the same way as experimental studies in the natural sciences. The impact of an extension activity is measured by comparing experiment and control groups. The groups are compared at two points in time i.e., before and after the introduction of a program activity in the experiment groups. The extent to which objectives are attained is measured according to single predetermined criteria such as net income of farm production or adoption of specific farm practices.

Such an experimental design is appropriate when evaluating programs with well-defined and well-know objectives and target groups, and when the experiment situation is well controlled. When program objectives are multiple and to some extent contradictory, when target groups are heterogeneous with respect to a variety of characteristics and when the experiment situation includes a large number of influencing factors that interact in a complex way, the value of information received from an experimental evaluation study is limited. But these conditions apply to an increasing extent to agricultural extension programs of today. Therefore, I think there is a need to complement the hitherto predominating experimental evaluation design in agricultural extension with (1) qualitative and process oriented evaluation studies and (2) careful evaluations of program objectives.

Qualitative and Process-oriented Evaluation Studies

In the traditional experimental evaluation studies one has not registered what happens between the before-and-after measurements. We can only assume that differences between experiment and control groups are caused by the intervening program activity. But we do not know. There are a variety of factors that influence farming practices and outcomes and these factors interact in a unique way in each farming community. Unless a large number of experiment and control groups are compared, we cannot be sure that differences between them are actually caused by the program activity.

If observations are restricted to before-and-after measurements we also do not know *how* changes actually occurred. However, often we want to know not only that changes took place as the result of a program, but also *how* they took place. Unless we know what happened, we do not know if and how a program can be improved and we cannot judge, if and how the program would work in another and somewhat different setting.

Weiss and Rein in a critical analysis of the experimental evaluation approach suggest an alternative methodology to overcome these deficiencies (23). They point to a need for more qualitative and process-oriented evaluation studies, in which the evaluator follows the program in operation and includes qualitative evidence in a description of what happens. The emphasis in such an alternative evaluation approach is more on *learning what happens* as the result of a program than *measuring change* in one or another characteristic. By such an approach we would learn more about the reasons for program failure and success. Thereby we would be in a better position to assess the quality of past programs and know better how to improve the quality of future programs.

Evaluation of Program Objectives

As the goals of the Agricultural Extension Service have been broadened, program success or failure is not adequately determined simply by measuring the extent to which one single program objective is achieved. When assessing the value of a program, many aspects of program outcomes need to be considered. But efficiency in farming, income distribution among farmers, employment opportunities in rural areas, environ-

mental implications etc, can be affected in many different ways. A large number of measuring criteria must be included in the evaluation and it is difficult to state them in advance. When the criteria are stated in advance important but unanticipated program outcomes can easily be omitted.

This again calls for a qualitative and process-oriented evaluation approach in which anticipated as well as unanticipated program outcomes are continuously registered. But the broadening of the purpose of the Extension Service also directs our attention to the importance of a careful evaluation of *program objectives*.

The importance of evaluating program objectives has been recognized for a long time. Already in the hand-book, *Evaluation in Extension*, Frutchey writes that (2:8):

> After the needs and interests have been identified, the people, working with the help of extension personnel, can decide on their objectives. This involves a definition of what is to be accomplished in relation to the various needs and interests, both immediate and long-time, as well as how and by whom these accomplishments are to be instrumented. Criteria for this stage can be established and evaluations of both content of the objectives and procedures followed in their determination can be made.

Suchman in his wide-spread, *Evaluative Research*, also emphasizes that "inherent in evaluation is the process of assigning value to some objective." He calls for a careful examination of the value of program objectives including an analysis of the relationship of objectives to their underlying assumptions (20:28-29).

Evidently, it is of little value that program objectives are accomplished, that adequate methods are used and resources efficiently utilized etc., if the objectives are questionable. As pointed out by Steele: "Achievement of a poor objective does not result in a good program" (17:14). Therefore, a crucial question in any evaluation study is: Are program objectives desirable, important and urgent to the intended target group and to the society as a whole?

How then should we go about when evaluating program objectives? Stufflebeam *et al* have devoted extensive attention to this question (18, 19). The evaluation of objectives is included in what they call context evaluation. Context evaluation they define in the following way (19:218):

> Its purpose is to provide a rationale for determination of objectives. Specifically, it defines the relevant environment, describes the desired and actual conditions pertaining to that environment, identifies unmet needs and unused opportunities, and diagnoses the problems that prevent needs from being met and opportunities from being used.

The most crucial part of context evaluation is to identify and assess *needs* as a basis for evaluating objectives. This raises further questions: How are needs to be determined? According to what standards and whose standards? Which needs should be met? Whose needs? Why?

Normative, Felt and Derived Needs

In a research study carried out at the Swedish University of Agricultural Sciences it is suggested that we should distinguish between different categories of needs according to how they are defined and who defines them. Three categories of needs are discussed: (1) normative,

(2) felt (or expressed) and (3) derived needs (8).

When a need is defined as a gap between an actual situation ("what is") and a desirable situation ("what should be"), where the desirable situation is determined by a public institution, it is called a *normative need*. (I prefer the term *normative* before "real" or "objective" as it emphasizes that a value-judgement is implied also in cases when the actual situation is based on a careful analysis of empirical facts and the desirable situation complies with a commonly accepted social norm.)

Normative needs strongly predominate in the planning of agricultural extension programs in Sweden. The desirable situation is usually based on governmental policies and/or the technology recommended by public institutions.

If we ask the farmers what kind of information or programs they would like to get from the Agricultural Extension Service, we find out their *felt (or expressed) needs*. This approach of defining needs has serious limitations. We cannot expect that many farmers perceive the planning of agricultural extension programs as an urgent concern. Nor can we expect that many of them have reflected on how the Agricultural Extension Service could contribute to their immediate or future well-being. Therefore, we must recognize, that when asked about their needs for agricultural extension programs, farmers' answers might not adequately reflect what they actually need (as perceived by themselves). Instead it seems most likely that they will respond with what happens to come to their minds and that their answers will be strongly influenced

by what they know of programs being offered and what they imagine that the interviewer would like to hear.

Thus, farmers' expressions of felt needs for agricultural extension programs might neither be authentic nor complete. To overcome this deficiency a third type of need identification approach was applied in the study. In addition to direct questions about what extension programs they prefer, farmers were asked about their attitudes and aspirations in farming. Such questions refer directly to the life and work experienced by the farmers. Therefore, we can expect that their answers to these questions have a higher validity than their answers to questions about what extension programs they prefer. It is further proposed, that if we know farmers' attitudes and aspirations in farming, i.e. what they like and strive for in farming, we have a basis from which to identify what type of extension programs would meet their needs in farming as they themselves perceive them. Needs that in this way are derived from expressed attitudes and aspirations are called *derived needs*.

Which of these approaches are most appropriate when identifying needs as a basis for agricultural extension programs? And how should we choose from an almost infinite number of needs which are to be met?

These questions cannot be answered through empirical research. Needs identified according to the approaches described above overlap to a greater or lesser extent. They complement but do not substitute each other. None of them can be selected as the only or best alternative.

Needs do always ultimately rest on value-judgements. A need is always *for* something, and what it is for is defined by a norm. In a democratic society, no single institution, group of professionals or

group of clients can claim that they are superior or have the right to prescribe what norms should be given priority in agricultural extension programs. Instead, program priorities should be determined in an ongoing process of interaction between different interest groups.

Thus, in my opinion, the three categories of needs are all useful and necessary as a basis for program planning in agricultural extension. The task of empirical research is not to prescribe which needs and whose needs should be met. Its task is to define and examine a range of possible alternatives representing different perspectives that can serve as a basis for decision-making.

A short remark about the terminology. The concepts normative, felt and derived needs are ambiguous and confusing. All needs are normative in the sense that they are defined in relation to a value, most needs are probably "felt" by one person or another and all needs are derived from some kind of objective or subjective evidence. The selection of this terminology in the study is not based on its merits but on its compliance with the literature in the field. I think we should consider if it would not be better to abandon this terminology and apply a more descriptive one, where needs are categorized according to how they are defined and who defines them (farmers' needs for .... as defined by ... on the basis of...).

An Empirical Study of Farmers' Needs for Agricultural Extension Programs

In the research study referred to in the previous section an attempt was made to explore derived and felt needs for agricultural extension programs among dairy farmers in a Swedish province. Data were collected by directly interviewing a stratified sample of farmers representing different age groups and herd sizes. The interviews were made according to a questionnaire of structured questions. A majority of the questions had fixed responses. Out of a sample of 234 dairy farmers 211 farmers were interviewed, which is equal to a response rate of 95 percent.

An attempt was made to identify farmers' *derived needs* for agricultural extension programs by asking them about their attitudes and aspirations in farming. Attitudes in farming were measured in questions reflecting their evaluations of (1) stability-change, (2) debt and (3) environmental concerns. Aspirations in farming were measured in questions about their past, present and planned practices. The aspects of aspirations measured include (1) aspirations for economic efficiency, (2) aspirations for changes in farming, (3) aspirations for work convenience, (4) aspirations for leisure, (5) aspirations for cooperation and (6) aspirations in environmental aspects.

Farmers' attitudes and aspirations were assumed to reflect a more or less instrumental orientation in the efficient operation of a farm enterprise in our present economic and social context. A farmer who (1) is in favor of change, (2) is positive to debt and (3) has no objections to the environmental implications of modern farm practices,

is referred to as "more instrumentally oriented". In respect to aspirations in farming, "more instrumentally oriented" farmers are expected (1) to be more concerned about the application of practices that improve economic efficiency, (2) to make more changes in farming, (3) to mechanize for work convenience, (4) to take time off for leisure, (5) to try to exchange jobs and equipment with other farmers and (6) to relate instrumentally to the environment in their farming practices.

Farmers' *felt needs* for agricultural extension programs were obtained from a question about what program content they find most important. Farmers were asked to indicate their preferences from a list of eight alternatives including all topics commonly dealt with in agricultural extension work.

In addition to questions reflecting derived and felt needs farmers were asked about their perceptions of present agricultural extension programs, their preferences concerning approaches in agricultural extension work and about a selection of individual and situational background characteristics.

Research Findings and Interpretation

The analysis of the data shows that there is a considerable variation among the farmers with respect to their attitudes and aspirations in farming. Furthermore, farmers' attitudes and aspirations relate in a consistent way. Attitudes and aspirations that are assumed to reflect the same orientation in farming are consistently positively related (Table 1). Thus, on the basis of their attitudes and aspirations it

Table 1. Correlation Coefficients and Level of Significance of Correlations between Different Aspects of Farmers' Attitudes and Aspirations in Farming.

ASPIRATIONS / ATTITUDES	Concerned about Economic Efficiency	Makes Changes in Farming	Mechanizes for Work Convenience	Takes Leisure Time off	Cooperates with Other Farmers	Instrumental towards Environment
Favors Change	.17**	.24***	.25***	.24***	.12*	.14*
Positive to Debt	.19**	-	.21***	.18**	.18**	-
Instrumental towards Environment	.32***	.17**	.25***	.22***	.25***	.29***

* = .05; ** =.01; *** = .001 level of significance

seems possible to differentiate between farmers according to where they stand on a scale ranging from a "more instrumental" to a "less instrumental" orientation in farming. It was further found that a "more instrumental" orientation relates positively to the following background characteristics: short time as a farmer, frequent participation in educational and organizational activities, large farm enterprises and intensive production.

As the "more instrumentally" oriented and the "less instrumentally" oriented farmers like and strive for different things in farming, they are likely to have different perceptions of what kind of information is useful to them, i.e. to have different derived needs for agricultural extension programs. The "more instrumentally" oriented farmers are likely to perceive extension programs focusing on economic efficiency as more useful than the "less instrumentally" oriented farmers. The "less instrumentally" oriented farmers are likely to pay more attention to other aspects such as: how to improve and maintain farm production without major changes in the pattern of production and without getting into debt, how to maintain a sense of being related to nature and animals and how to avoid affecting the environment in a negative way.

However, we must keep in mind that these conclusions about farmers' derived needs for agricultural extension programs are based on *assumptions* about what their attitudes and aspirations stand for. The research *indicates* that farmers differ in their derived needs for agricultural extension programs and that they perceive the usefulness and applicability of information differently. But the research findings do not tell us in specific and concrete terms what farmers' perceived needs are. It can be objected that

attitudes are often poor predictors of behavior and that the aspirations measured reflect farmers' perceptions of various external forces rather than their "actual" strivings. To identify farmers' perceived needs for agricultural extension programs in more specific terms it is necessary to go beyound the interview procedure applied in this study. It is probably necessary to collect data in open interviews, where a farmer is first asked to describe his farming situation in his own words. After the problem situation and situational pre-conditions have been defined by the farmer himself, one would ask him to tell what he likes and strives for in questions that relate to his specific situation and experience.

The data from the question on farmers' felt needs for agricultural extension programs support the assumption that farmers' answers reflect present program offerings and surface interests rather than what they would actually perceive as useful when trying to accomplish their likings and strivings. It was not possible to identify and characterize specific categories of farmers on the basis of their felt needs. However, the question applied as an indicator of farmers' felt needs for extension programs has serious shortcomings. Farmers were asked to choose between subject matter areas in general terms. It would have been more appropriate to ask them to choose between problem areas that relate more directly to their farming reality. An even better approach would be to ask them what program content they perceive useful in relation to open questions on their likings and strivings in farming. But it must be remembered that farmers cannot ask for things they do not know about. To a certain extent an agricultural extension agency bases its very legitimacy on the fact that farmers do not always know

what information is useful to them. There is always a considerable risk that if based on felt needs, agricultural extension programs will primarily benefit those farmers who are initially best informed and therefore are in a better position to judge and select program areas that are useful to them.

Difficulties in Applying Farmers' Needs as a Basis for the Evaluation of Program Objectives

To evaluate program objectives on the basis of needs, we have to decide which needs should be given priority. Which needs are desirable, important and urgent? We cannot make judgements about the extent to which program objectives meet appropriate needs, until we have developed a point of view with regard to that question.

In Sweden the Agricultural Extension Service is a governmental agency aimed at the implementation of the agricultural policy. Therefore, the normative needs stated in the agricultural policy provide a set of criteria that should be used in the evaluation of program objectives. The evaluation of objectives of agricultural extension programs should include an examination of how their achievement affects economic efficiency, occupational opportunities, income distribution, environmental protection etc.

Derived needs, if adequately identified, reflect what farmers like and strive for. If we know the derived needs, we can make judgements about the extent to which program objectives meet the needs of different categories of farmers' as they perceive them. Knowing how program objectives meet farmers' perceived needs is important for several reasons. If program objectives do not meet farmers' needs, it is less likely that they will expose them-

selves to the programs and be influenced by them. But derived needs cannot serve as the only criteria when evaluating objectives. That program objectives correspond to the derived needs of a group of farmers does not assure that the objectives are desirable, important or urgent from a societal point of view. Both normative needs and derived needs must be included when evaluating program objectives of a governmental agency.

The research presented in this paper provides an illustration of this problem. It was found that "the more instrumentally oriented" farmers have more favorable perceptions of agricultural extension programs than "the less instrumentally oriented." The former category of farmers tends to assign a higher value to extension programs, to have more confidence in extension agents and to find the program content more applicable than the latter group (Table 2). These observations indicate that present programs meet the perceived needs of "the more instrumentally oriented" farmers better than the needs of "the less instrumentally oriented."

However, "the more instrumentally oriented" farmers are characterized by more participation in organizational and educational activities, run larger enterprises and have a higher intensity in their farm production than "the less instrumentally oriented." This means that present extension programs tend to favor those who initially have most resources with respect to knowledge, social contacts and material values. Thereby, the normative needs of income distribution and rural employment are counteracted. Thus, even if present programs correspond with the derived needs of a large and important category of farmers, the programs may be questionable from a societal point of view.

Table 2. Correlation Coefficients and Level of Significance of Correlations of Attitudes and Aspirations in Farming to Perceptions of Agricultural Extension Programs.

	Extension Programs Valuable	Extension Agents Credible	Content Applicable
ATTITUDES			
Favors Change	.35***	.40***	.43***
Positive to Debt	.15*	.16**	.24***
Instrumental towards Environment	.14*	.27***	.52***
ASPIRATIONS			
Concerned about Economic Efficiency	.20**	.16**	.32***
Makes Changes in Farming	.24***	.27***	.27***
Mechanizes for Work Convenience	.35***	.32***	.40***
Takes Leisure Time off	.23***	.18**	.27***
Cooperates with Other Farmers	-	.14*	.23***
Instrumental towards Environment	-	.17**	.29***

* = .05; ** = .01; *** = .001 level of significance

On the other hand, if program objectives do not correspond with farmers' perceived needs, this does not necessarily mean that the programs are not desirable for the society and/or the farmers. For instance, very few farmers seemed to perceive a need to learn how to avoid accidents and injuries in farm work. However, it is very likely that most farmers would benefit very much from improving their knowledge and practices in this area. Therefore, the Agricultural Extension Service also has an obligation to develop educational objectives aimed at helping farmers recognize needs that they suppress or ignore.

If an educational institution refers to normative needs in an authoritarian and prescriptive way, information about the perceived needs of its constituency can be used in a manipulative way to achieve predetermined objectives. The more information we have about a group of people, the better are our possibilities to influence, pursuade or control that group. I see no easy way out of this dilemma. As pointed out by Monette (9) an educational institution has a social responsibility to make value choices and cannot avoid pursuing certain values. But it can and should try to avoid indoctrination.

In order to avoid indoctrination it is important that the values of the extension agency are made explicit and that neither the normative needs for the agency nor the perceived needs of the farmers are absolutized and taken for granted. Both categories of needs must be critically examined and continuously problematized as to their causes and consequences. This is easy to say but difficult to realize. The evaluation of program objectives on the basis of needs is a complex undertaking.

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